A REFERENCE DOCUMENT FOR THE PRELIMINARY ASSESSMENT OF CHLOROPRENE LEVELS IN ST. JOHN THE BAPTIST PARISH:

Evaluation of Potential Health Risks for Elementary School Students based on Early Sampling Results following Emissions Reductions

June 14, 2018

Louisiana Department of Health
Office of Public Health
Section of Environmental Epidemiology and Toxicology

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Background and Statement of Issues

Site History

In 1931, the DuPont chemical company invented Neoprene, a synthetic chemical-resistant and weather-resistant rubber best recognized for its use in wet suits and as a base resin in adhesives and coatings. DuPont's Ponchartrain Works facility, located on the east bank of the Mississippi River in LaPlace, LA, became the leading producer of Neoprene. Neoprene is the trade name for polychloroprene, a rubber polymer formed by linking together molecules of chloroprene. in North America. The DuPont facility's Neoprene operations were taken over by DENKA Co. Ltd. on November 1, 2015 [1].

National Air Toxics Assessment

On December 17, 2015, the U.S. Environmental Protection Agency (EPA) 2011 National Air Toxics Assessment (NATA) was released. EPA developed NATA as a broad-scale screening tool to prioritize the evaluation of air pollutants and emission sources in locations of interest to gain a better understanding of risks. As stated by EPA, NATA "is subject to limitations in the data, modeling, and default assumptions used. As a result, the NATA should only be used to identify areas for further investigation and not to identify actual exposures and associated risks to specific individuals" [3]. Modeling estimates performed by this screening tool indicated the possibility of elevated cancer risk from chloroprene emissions from Denka/Dupont Neoprene production facility operations in LaPlace, Louisiana [1, 2]. Based on animal studies and a lack of human data, chloroprene has been classified by EPA as "likely to be carcinogenic to humans" since September 2010 [1, 4].

Preliminary Air Sampling

In response to the possibility of elevated risk modeled by NATA, EPA Region 6 and the Louisiana Department of Environmental (LDEQ) conducted preliminary ambient air sampling in March of 2016 to decide if a more extensive and comprehensive monitoring and assessment plan was needed. LDEQ collected instantaneous or "grab" samples and analyzed those samples using LDEQ's Mobile Air Monitoring Lab (MAML). Additionally, EPA collected a small number of 8-hour and 24-hour canister samples. Both EPA's and LDEQ's air monitoring detected chloroprene off-site within and outside of a 1-mile radius of Denka.

Establishment of Current Sampling Protocol

The concentrations of chloroprene detected during the preliminary sampling events indicated the need to collect additional air monitoring data in order to adequately assess potential health risks to the community. In a 2016 memo, EPA stressed that because the primary potential health concern associated with long-term exposure to chloroprene emissions is related to cancer risk, more community air data is necessary to gain an understanding of the potential health risk that might be associated with the long-term presence of chloroprene in the area [5].

Figure 1. Map of Air Monitors in the Community Adjacent to the Denka Facility in LaPlace, LA

Source: https://www.epa.gov/la/laplace-louisiana-air-monitoring-map

EPA selected the following six sites as locations for monitoring levels of chloroprene in ambient air (see Figure 1):

- 238 Chad Baker
- Acorn and Highway 44
- East St. John High School
- 5th Ward Elementary School
- Mississippi River Levee
- Ochsner Hospital

The ongoing ambient air sampling follows a 1-in-3 schedule (once every third day) with each sampling event occurring over a 24-hour period. Samples are collected using SUMMA canisters calibrated for 24-hour sampling [6].The EPA set up an informational website at https://www.epa.gov/la/laplace-st-john-baptist-parish-louisiana to keep the community updated on ambient air sampling results.

Administrative Order on Consent

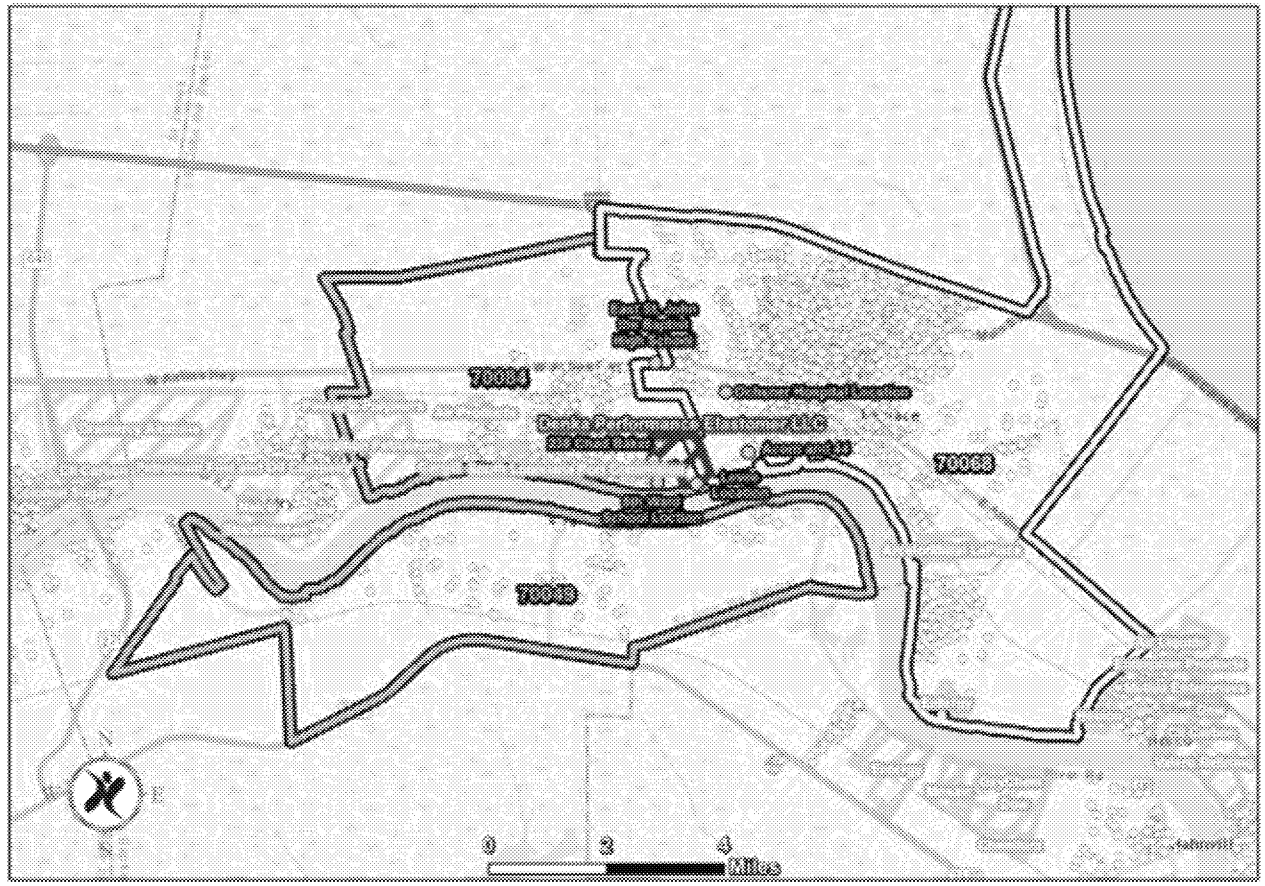
On January 6, 2017, LDEQ and Denka signed an Administrative Order on Consent (AOC) outlining Denka's voluntary commitment to reduce emissions of chloroprene at the LaPlace facility by 85 percent from the facility's 2014 baseline chloroprene emissions [2]. Installation of emissions controls at the facility began in February 2017 and was completed in December 2017.

Demographics

Figure 2 shows the population distribution in the community surrounding the Denka facility. The current total population of St John the Baptist Parish is 45,924. Of this total population, 51.4% are female and 48.6% are male. Fifty-six point four percent (56.4%) are African American and 40.6% are White. The remaining 3.0% are from other races. Approximately 13.6% of the total population are 65 years of age or older. The median household annual income in 2016 was $51,406 and 18.5% of the population was living below the poverty threshold [7].

Figure 3 shows the locations of schools near the Denka facility. The community has expressed concerns about the safety of children attending local schools, specifically focusing on whether students at the school closest to the facility, Fifth Ward Elementary School, should be relocated to a site farther away.

Figure 2: Population Distribution Surrounding the Denka Facility



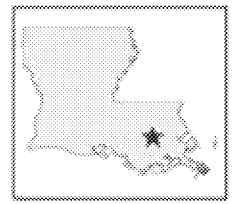
Denka Performance Elastomers LLC in St. John Parish June 22, 2017

ZIP CODE	TOTAL POPULATION	WHITE	BLACK	ASIAN	OTHER	MALE	FEMALE
70068	7532	3324	3997	36	155	3799	3763
70043	2481	131	2344	0	26	1131	1350
70047	34128	16630	16433	307	1538	16624	17487

Air Monitor

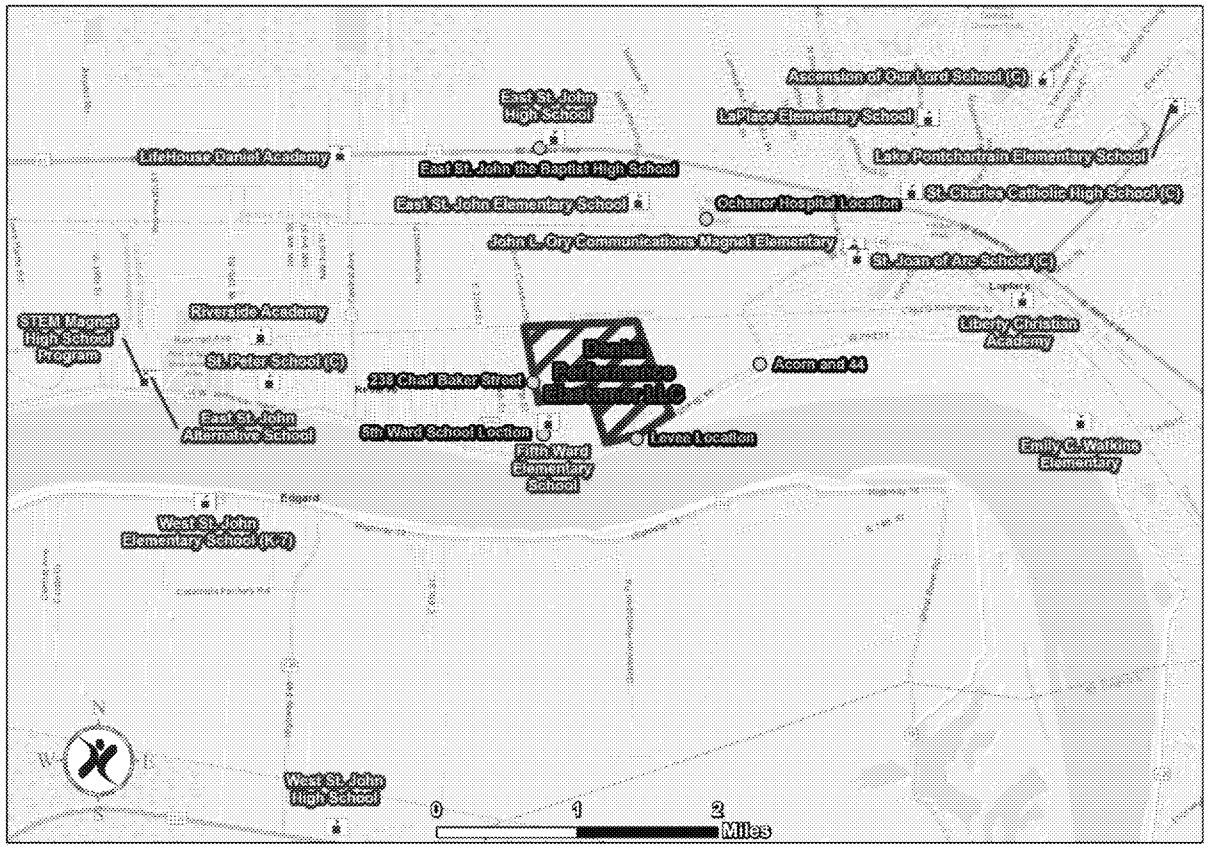
Population Density*

1 Dot = 25 People*



Map produced June 22, 2017 by the Louisiana Department of Health / Office of Public Health / Section of Environmental Epidemiology and Toxicology (SEET) using data from the 2010 Census.
* 2010 population density randomly distributed by census block (may not be included on the map)
Note: Zip code 70068 extends to the border of Tangipahoa Parish on the east side of I-55.
Disclaimer: SEET cannot guarantee the accuracy of the information contained on these maps and expressly disclaims liability for errors and omissions in their contents.

Figure 3. Schools near the Denka Performance Elastomers, LLC Facility



Map produced June 8, 2018 by the Louisiana Department of Health / Office of Public Health / Section of Environmental Epidemiology and Toxicology (SEET).
* This school database is a combination using data obtained from the Louisiana Department of Education in 2014 and Google.
Disclaimer: SEET cannot guarantee the accuracy of the information contained on these maps and expressly disclaims liability for errors and omissions in their contents.

Data Summary Results

Results from validated ambient air data sampled from May 2016 to May 2018 are listed in Appendix A, Table A-1. A total of 1,431 samples, excluding those with invalid results or no results reported, were collected during this period. Results reported as not detected (ND) are highlighted in blue.

The full dataset is evaluated in Appendix B:

Tables B-1 through B-4 summarize the chloroprene concentrations detected in air sampled from the community during 2016, 2017, and 2018.

Figures B-1 through B-6 display the following information for each air sampling site:

- the percentages of samples in which chloroprene was found at levels above the method detection limit at each location,
- the percentage of samples with chloroprene concentrations below the non-cancer comparison value (20 ug/m3), and
- the percentage of samples with chloroprene concentrations below the EPA's 100-in-1 million preliminary cancer risk-based comparison level (0.2 ug/m3).

Figures B-7 – B-9 summarize the above mentioned information across all of the air sampling sites.

Figure B-10 displays the average chloroprene concentrations at each site from 2016-2018.

Statistical analyses of chloroprene concentrations measured at each sampling site are included in Appendix C. Tables C-1 to C-6 and Figures C-1 to C-6 display the averages for each site during each year, with the confidence interval whiskers on each bar marking the range of values that are certain to contain the true mean 95% of the time. A trend of decreasing chloroprene concentrations in ambient air was observed at all sites from the initial sampling year (2016) until 2018. LDH cannot predict how chloroprene concentrations will continue to trend in the community as more data is collected.

Toxicology Evaluation

Chloroprene (2-chlorobutadiene): Much of the toxicological information on chloroprene is derived from occupational exposures in workers. The Occupational Safety and Health Administration (OSHA) time weighed average (TWA) is 25 parts per million (ppm) (90,500 ug/m^3) (skin); the American Conference of Governmental Industrial Hygienists (ACGIH) has a 10 ppm (36,200 ug/m^3) threshold limit value-time weighed average (TLV-TWA); and the National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit (REL) is 1 ppm (3,620 ug/m^3). Acute (short term) occupational exposures above the standards may cause headache, irritability, giddiness, dizziness, respiratory irritation, nausea, gastrointestinal disorders, skin and eye irritation and fatigue in workers. Chronic exposures (longer

term) in the work place in ppm concentration levels may contribute to liver function abnormalities, disorders of the cardiovascular system and depression of the immune system. Animal studies have found an increased risk of tumors and are the evidence for the classification of chloroprene as a likely carcinogen. The few studies on the carcinogenic effects in humans are inconclusive because of co-exposure to other occupational chemicals, smoking, and other risk factors for cancer.

For non-occupational exposures, EPA derives a chronic RfC (reference concentration) for continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. Animal studies that derived a LOAEL (lowest observed adverse effect level) was determined to be 12.8 ppm (46.3 mg/m3). The RfC was derived using a 10% benchmark dose (BMD) of 2 mg/m3 (5.5 ppm) to which uncertainty factors, lack of data, and interspecies extrapolations of 100 were applied to derived the RfC of 0.02 mg/m3 or 20 ug/m3 (55 ppb).

When inhaled, chloroprene enters the body through the respiratory system, is absorbed into the bloodstream, and distributed throughout the body. Chloroprene is rapidly metabolized, which makes it difficult to measure in the body. During metabolism, chloroprene may generate reactive intermediates that are a mechanism of its toxicity and are a factor in its being considered a potential carcinogen. There are insufficient data on the toxicokinetics to describe how chloroprene acts in the body.

Chloroprene is oxidized in the liver through the cytochrome P-450 system (CYP2E1) to form a monoepoxide free radical which is the reactive intermediate which may react for the carcinogenic effects. Further metabolism serves to detoxify the reactive intermediate: epoxide hydrolase rapidly hydrolyzes the epoxide to much less toxic metabolites; these metabolites are then rapidly conjugated with glutathione to form the 3-chloro-2-hydroxy-3-butenyl mercapturic acid (Cl-MA III) which is a unique metabolite of chloroprene. Other chloroprene metabolites such as DHBMA (3,4-dihyrdroxybutyl-MA) and HOBMA (4-hydroxy-3-oxybutyl–MA) are also metabolites of butadiene and other compounds that are found in cigarette smoke and gasoline.

These metabolites are excreted in urine. The urinary metabolites may serve as biomarkers to indicate exposure to chloroprene but are not biomarkers of effect or indications of potential damage that may result in a cell mutation in future years. The Cl-MA III is a metabolic conjugate of chloroprene that has been detoxified and excreted.

The concentrations of chloroprene detected in air monitoring in St. John the Baptist parish are in the parts per billion (ppb) range and more than 1000 times less (10^{-3}) than occupational levels and concentrations used in the animal studies. At this low level, health effects (including cancer) will not be directly observed in people. For this reason, risk assessment modeling is used to provide information to regulatory agencies for determining standards and remedial actions. Risk assessment modeling does not provide information on the prediction or estimation of direct effects, but is a useful tool for comparison of risks using standardized conditions.

Cancer Statistics Reviews

In a previous Letter Health Consultation dated March 2, 2018, LDH evaluated the Louisiana Tumor Registry's (LTR) cancer rate incidence data (1988-2014) for St. John the Baptist Parish for lung and liver cancers, which are both related to chloroprene exposure. Overall, cancer incidence rates of the lung and liver in St. John the Baptist Parish from 1988-2014 did not differ significantly from those in Louisiana [8].

Act 373 of the 2017 Louisiana Legislative Session requires that the Louisiana Tumor Registry deliver yearly census tract data to local parish governments. Upon review of this recently published census tract cancer incidence data (March 2018) for St. John the Baptist Parish, all cancers combined and prostate cancer have significantly higher incidence rates than state rates for the years 2006-2014 based on the Census 2010 state population. Prostate cancer is not related to chloroprene exposure [9]. The cancer incidence rates for all cancers combined is not very useful for explaining or exploring potential etiologies since there are many known risk factors for cancer such as smoking, occupational exposures, etc. that are not controlled in the cancer incidence rates

Risk Assessment for Elementary School Students

Methodology

ATSDR's Partnership to Promote Local Efforts to Reduce Environmental Exposure (APPLETREE) Program Project Officer arranged a conference call between LDH, DEQ, and two ATSDR Air Subject Matter Experts. Factors influencing air monitoring and data limitations were discussed. The lack of sample points since the implementation of emissions controls was emphasized. Following the call, LDH reached out to EPA Region 6 to request an increase in the frequency of community air monitoring. In addition to the phone consultation on the limited air monitoring dataset, ATSDR has been providing technical support on the evaluation and interpretation of cancer incidence data.

The Ambient Air Standard listed for chloroprene (classified as a Louisiana Toxic Air Pollutant, or TAP) under the Louisiana Administrative Code is 857 ug/m^3 (an 8-hour average) [10].

The EPA has established a non-cancer comparison value for long-term exposure of 20 ug/m^3. A continuous inhalation exposure to chloroprene at this concentration for humans, including sensitive individuals, is likely to be without a significant risk of harmful effects during a lifetime. Assessment of non-cancer health risks was not evaluated because ambient chloroprene concentrations in the community surrounding the Denka facility did not exceed 20 ug/m^3 for prolonged periods of time during the March-May 2018 interval.

Assessment of the theoretical excess cancer risks posed to elementary school students in the community surrounding the Denka facility were performed using data limited to the March – May 2018 sampling

events. Although installation of the emissions controls was completed in December 2017, the upgraded system was not fully functional until March 2018.

To determine whether concentrations of chloroprene detected in ambient air in LaPlace, LA would increase an individual's risk of developing cancer, LDH estimated the excess cancer risk for exposure to the reported chloroprene sampling result concentrations. The theoretical excess cancer risk represents the increase in the probability of an individual developing cancer as a result of being exposed to a contaminant over a lifetime. Because of the uncertainties involved in estimating carcinogenic risk, a weight-of-evidence approach is used to describe carcinogenic risk in words as well as numeric terms. The results of the carcinogenic risk calculations estimate the worst-case maximum increase in the risk of developing cancer after exposure to the contaminant. This estimation is accurate within one order of magnitude greater or less than calculated. In other words, a calculated cancer risk of 2 excess cancers per 10,000 people might actually be 2 excess cancers per 1,000 people or 2 excess cancers per 100,000 people. The lifetime excess cancer risk of 10-4 (or 1.0E-04), which is 1 excess cancer per 10,000 people, is the upper bound of the range used by EPA's Superfund program to make decisions about the need to take action at contaminated sites . Estimates of theoretical cancer risks that fall below 1.0E-06 (or one in 1,000,000) are considered to pose no significant increase in cancer risk [11].

The increases in theoretical excess cancer risk potentially associated with exposures to chloroprene in the community were estimated separately for children attending school at the current Fifth Ward Elementary School campus and for children attending school at another location within the parish. To ensure that sufficient data points were available for evaluation, the ambient air data collected by EPA from March–May 2018 was separated into two "campus locations", excluding the Acorn & Highway 44 location:

1. Data from the three air sampling sites closest to the Denka facility, 238 Chad Baker, Fifth Ward Elementary School, and Mississippi River Levee, were combined to represent exposures for students at the current Fifth Ward Elementary School campus,
2. Data from the two sites furthest from the Denka facility, East St. John High School and Ochsner Hospital, were chosen to represent exposures for students attending schools at another location. For the purpose of this assessment, the other location is identified as East St John Elementary School, which is the campus located between these two monitors

Chloroprene concentrations averaged for each campus location were used to calculate exposure concentrations for children during school hours at each location; all other exposure concentrations were calculated using averages from all six sampling sites in the community. Table 1 lists the concentrations and lower and upper 95% confidence limits used for risk assessment at each school location and for all six sampling sites together.

Table 1. Chloroprene Concentrations (in ug/m^3)

	Average	95% LCL	95% UCL
All 6 Sampling Sites	1.07	0.60	1.54
Fifth Ward Elementary School	1.54	0.67	2.41
Est St John Elementary School	0.40	0.20	0.59

LCL = Lower Confidence Limit
UCL = Upper Confidence Limit

Assessments for exposure scenarios at each school location were performed using the average concentrations and their corresponding 95% confidence intervals. As a conservative estimate, samples reported as ND were assessed using a concentration of half the current detection limit.

Theoretical increases in excess cancer risks for exposures to chloroprene by inhalation were estimated using the following equation:

Risk = IUR x EC x ADAF

Where: IUR $(ug/m^3)^{-1}$ = Inhalation Unit Risk (3×10^{-4} per ug/m^3 for chloroprene)

EC (ug/m^3) = exposure concentration

ADAF: Because chloroprene has been identified as having a mutagenic mode of action, cancer risk assessments for early-life exposures to chloroprene include Age Dependent Adjustment Factors (ADAFs). An ADAF of 3 (for 2 to less than 16 years of age) was used for chloroprene cancer risk assessments [12].

To calculate EC for the excess cancer risk equation:

EC = (CA x ET x EF x ED)/AT

Where: CA (µg/m^3) = contaminant concentration in air;

ET (hours/day) = exposure time;

EF (days/year) = exposure frequency;

ED (years) = exposure duration; and

AT (lifetime in years x 365 days/year x 24 hours/day) = averaging time (where lifetime in years = 70)

Table 2 lists the standard values used to estimate the concentrations of chloroprene children would be exposed to at school and at home. Exposure concentrations calculated for each school location exposure are listed in Table 3.

Table 2. Standard Values Used to Estimate Exposure Concentrations for School Children 5 to 10 years of age

	Exposure Scenario		
	School	Home	Summers/Weekends
ET	8	16	24
EF	180	180	185
ED	5	5	5

ET = exposure time in hours/day
EF = exposure frequency in days/year
ED = exposure duration in years

Table 3. Exposure Concentrations (in ug/m^3) for School Children 5 to 10 years of age

	Exposure Scenario			
	Fifth Ward	St John	Home	Summers/Weekends
Mean	0.02	0.00	0.03	0.04
95% LCL	0.01	0.00	0.01	0.02
95% UCL	0.03	0.01	0.04	0.06

LCL = Lower Confidence Limit
UCL = Upper Confidence Limit

The equation illustrating the theoretical increase in excess cancer risk associated with chloroprene exposures for elementary school children is therefore as follows:

Risk during five years of school attendance at either location:

$$Risk_{school\ years} = (IUR \times EC_{school} \times ADAF_{2\ to\ <16}) + (IUR \times EC_{home} \times ADAF_{2\ to\ <16}) + (IUR \times EC_{sum/wkds} \times ADAF_{2\ to\ <16})$$

Results

The excess cancer risks estimated for each exposure scenario (school attendance, being home, summers and weekends) experienced during five years of elementary school attendance are listed in Table 4. The theoretical excess cancer risks estimated for the elementary school years are listed in Table 5.

Table 4. Excess Cancer Risk Estimated for Exposure Scenarios during Elementary School Attendance Years (unitless)

	Exposure Scenario 5-10 years of age			
	Fifth Ward	St John	Home	Summers/Weekends
Mean	1.63E-05	4.20E-06	2.26E-05	3.49E-05
95% LCL	7.05E-06	2.11E-06	1.27E-05	1.96E-05
95% UCL	2.55E-05	6.28E-06	3.26E-05	5.02E-05

LCL = Lower Confidence Limit
UCL = Upper Confidence Limit

Table 5. Excess Cancer Risk Estimated for Elementary School Students at Fifth Ward Elementary vs. East St John Elementary (unitless)

	Five Years at Fifth Ward Elementary School	Five Years at East St John Elementary School
Mean	7.E-05	6.E-05
95% LCL	4.E-05	3.E-05
95% UCL	1.E-04	9.E-05

LCL = Lower Confidence Limit
UCL = Upper Confidence Limit

Estimation of theoretical excess cancer risks was used in this assessment as a method to compare theoretical risks due to chloroprene exposures at the Fifth Ward Elementary School site compared to the East St. John Elementary School site (as a surrogate for any site at a farther distance from Denka). These estimates do not predict the occurrence of health effects.

The excess cancer risk estimated for exposure to the concentrations of chloroprene encountered by children spending their elementary school years at the current Fifth Ward Elementary School campus location is 7×10^{-5} (95 % confidence interval = 4×10^{-5} to 1×10^{-4}). In other words, exposure to the average concentrations of chloroprene measured near the current Fifth Ward Elementary School campus location is conservatively estimated to pose a risk of the development of 0.4 to one excess cancer per 10,000 people, with an average of less than one excess cancer per 10,000 people.

The excess cancer risk estimated for exposure to the concentrations of chloroprene encountered by children spending their elementary school years at East St. John Elementary School is 6×10^{-5} (95 % confidence interval = 3×10^{-5} to 9×10^{-5}). In other words, exposure to the average concentrations of

chloroprene measured near an alternate school campus location is conservatively estimated to pose a risk of the development of 0.3 to 0.9 excess cancer per 10,000 people, with an average of less than one excess cancer per 10,000 people.

Limitations

Data evaluated for this assessment was limited to the time period during which the emission controls were fully functional (March-May 2018). The confidence intervals calculated for each site reflect variability caused by the small sample sizes.

The theoretical excess cancer risks calculated for this assessment are conservative theoretical estimates and do not directly translate into health effects. Calculation of these risks will change as more data are collected and evaluated.

The ambient air samples are collected over a 24-hour period every three days. These samples may not give an accurate representation of daily contaminant concentrations. Contaminant levels may be higher or lower during other times of year, different weather conditions, or different facility operations. Air modeling based on prevailing winds and other factors was not performed as a part of this assessment.

The results of this assessment cannot be generalized to predict the past, current, or future potential for health effects in individuals.

Preliminary Evaluation

An overall trend of decreasing concentrations from 2016 to 2018 has been observed at all six ambient air sampling sites in the community surrounding the Denka facility.

Based on data limited to the March-May 2018 sampling results, exposure to chloroprene in the community surrounding the Denka facility is not expected to cause non-cancer health effects.

Based on data limited to the March-May 2018 sampling results, transferring children from the current Fifth Ward Elementary School location to another location within the community would not greatly decrease their theoretical risks of developing excess cancers from exposure to chloroprene. The risks calculated for this assessment are conservative theoretical estimates and are not meant to predict actual health effects. These risk estimates may change as additional data become available.

As of June 2018, interpretation of future long-term estimates of risk (30- and 70-years) are limited due to lack of sufficient ambient air data on which to base assessments. More data would be needed to perform a comprehensive assessment of community health risks.

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APPENDIX A: Chloroprene Data

Table A-1. Chloroprene concentrations (in ug/m^3) in EPA ambient air canister samples (24-hr) collected from LaPlace, LA, May 2016 – March 2018

Sample Date	Sample Locations					
	238 Chad Baker	Acorn & Hwy 44	ESJH	5th Ward Elem	Levee	Ochsner
5/25/2016	ND*	1.29	0.831	ND	ND	ND
5/28/2016	--§	Invalid†	Invalid	--	Invalid	--
5/31/2016	7.58	30.3	2.02	3.07	6.13	17.5
6/2/2016	7.15	0.073	2.67	1.88	2.64	0.083
6/5/2016	11.1	ND	0.341	4.97	20.5	0.809
6/9/2016	5.48	0.624	1.25	3.41	4.93	4.68
6/12/2016	5.37	0.983	5.15	0.573	0.272	1.28
6/15/2016	1.21	0.225	1.07	1.74	0.366	10.8
6/18/2016	7.87	4.39	0.268	1.89	2.7	2.98
6/21/2016	5.08	ND	1.04	1.3	0.413	0.686
6/24/2016	0.305	6.82	0.029	ND	0.319	7.54
6/27/2016	0.163	1.19	0.417	ND	0.04	1.61
6/30/2016	4.53	ND	0.352	3.5	7.15	ND
7/3/2016	ND	0.054	1.69	ND	ND	4.28
7/6/2016	ND	ND	0.12	ND	ND	9.61
7/9/2016	1.71	4.75	0.762	0.345	1.88	6.02
7/12/2016	6.89	1.23	2.36	5.62	0.722	0.232
7/15/2016	12.4	0.881	0.914	3.63	6.46	1.53
7/18/2016	37	ND	0.276	44.3	1.7	ND
7/21/2016	5.01	1.18	2.12	11.3	4.9	1.06
7/24/2016	16.7	9.07	8.16	8.09	9.47	10
7/27/2016	ND	1.71	0.196	ND	ND	3.59
7/30/2016	2.49	5.3	2.67	3.15	6.35	11.2
8/2/2016	0.254	0.881	1.86	10.3	16.8	6.56
8/5/2016	5.84	12.5	2.39	8.67	21.4	5.48
8/8/2016	0.417	4.86	1.63	0.569	2.77	0.827
8/11/2016	ND	12.8	ND	ND	0.649	2.43
8/14/2016	Invalid	Invalid	Invalid	Invalid	Invalid	Invalid
8/23/2016	5.19	34.7	8.56	--	--	24
8/26/2016	1.61	0.468	0.301	6.06	2.23	1.37
8/29/2016	25.6	ND	0.627	38.4	0.073	ND
9/1/2016	0.798	ND	ND	13.1	8.09	ND
9/4/2016	31	39.2	10.2	34.7	74.7	7.65
9/7/2016	Invalid	2.21	2.17	3.44	2.14	1.17

Sample Date	Sample Locations					
	238 Chad Baker	Acorn & Hwy 44	ESJH	5th Ward Elem	Levee	Ochsner
9/10/2016	10.9	0.16	4.9	6.27	2.53	0.791
9/13/2016	46.1	ND	0.12	16.1	0.232	ND
9/16/2016	28.6	ND	0.921	0.693	ND	ND
9/19/2016	ND	0.105	0.033	ND	1.32	0.076
9/22/2016	0.363	ND	0.065	0.722	0.18	ND
9/25/2016	0.109	0.073	0.127	0.105	0.548	ND
9/28/2016	0.073	0.432	0.051	0.555	3.37	0.301
10/1/2016	0.051	ND	ND	ND	10.3	ND
10/4/2016	37.4	1.27	24.9	42.4	26.8	6.06
10/7/2016	32.8	0.403	1.37	5.77	4.24	0.704
10/10/2016	8.49	ND	ND	12.5	8.74	ND
10/13/2016	18.8	ND	3.57	1.76	1.27	0.258
10/16/2016	32.3	ND	ND	25.6	3.33	ND
10/19/2016	12.1	ND	1.7	0.232	ND	ND
10/22/2016	0.41	ND	ND	ND	13.5	0.073
10/25/2016	29.8	57.3	12	33	67.5	43.5
10/28/2016	25	ND	0.07	11.1	11.9	ND
10/31/2016	5.04	17.5	16.2	1.96	29.6	27.5
11/3/2016	18.8	ND	ND	66.4	2.3	ND
11/6/2016	32.6	0.54	0.102	28.9	3.12	0.12
11/9/2016	0.921	ND	ND	16.4	ND	ND
11/12/2016	0.221	ND	15.1	2.22	ND	ND
11/15/2016	ND	106	0.268	ND	54.8	59.8
11/18/2016	16.9	0.827	3.61	23.4	0.21	0.831
11/21/2016	8.27	153	0.388	1.6	147	66.7
11/24/2016	2.81	5.66	0.87	1.02	17.1	3.77
11/27/2016	3.74	0.025	ND	5.4	4.9	0.018
11/30/2016	0.018	0.025	0.058	0.025	0.802	0.218
12/3/2016	40.6	0.044	ND	0.979	ND	ND
12/6/2016	2.42	3.41	0.413	0.635	0.029	0.787
12/9/2016	ND	ND	ND	0.433	0.537	ND
12/12/2016	ND	0.196	2.41	ND	0.381	2.44
12/15/2016	ND	ND	ND	0.025	21.3	ND
12/18/2016	ND	ND	ND	ND	8.81	2.22
12/21/2016	40.3	1.71	0.889	37.4	17.4	3.21
12/24/2016	26.2	ND	0.82	20.9	10.6	ND
12/27/2016	17.1	0.649	1.11	16.7	0.812	0.232
12/30/2016	3.18	ND	ND	4.82	17.6	ND
1/2/2017	19.5	3.06	2.93	0.664	ND	2.76

Sample Date	Sample Locations					
	238 Chad Baker	Acorn & Hwy 44	ESJH	5th Ward Elem	Levee	Ochsner
1/5/2017	33.2	ND	0.577	17.5	4.68	ND
1/8/2017	1.28	ND	ND	1.81	Invalid	ND
1/11/2017	ND	ND	20.3	0.033	0.029	0.083
1/14/2017	20	ND	ND	75.1	0.381	ND
1/17/2017	ND	0.036	11	ND	0.036	0.522
1/20/2017	ND	7.76	0.145	ND	ND	1.78
1/23/2017	ND	6.09	ND	ND	ND	0.022
1/26/2017	ND	ND	ND	ND	0.939	0.297
1/29/2017	ND	0.352	ND	ND	ND	ND
2/1/2017	ND	ND	0.051	ND	ND	0.051
2/4/2017	0.058	ND	ND	0.141	0.203	ND
2/7/2017	ND	ND	0.087	ND	ND	0.051
2/10/2017	1.32	ND	0.022	1.15	9.68	ND
2/13/2017	0.316	14.2	ND	8.56	0.656	0.04
2/16/2017	0.073	2.69	ND	0.218	2.62	ND
2/19/2017	0.551	0.301	0.682	1.74	0.334	0.112
2/22/2017	0.109	1.96	0.047	0.091	3.06	0.16
2/25/2017	ND	0.939	ND	ND	35.8	11.1
2/28/2017	ND	0.265	7.76	ND	ND	1.27
3/3/2017	2.58	ND	ND	1.36	2.25	ND
3/6/2017	ND	ND	0.62	ND	ND	ND
3/9/2017	14.8	ND	1.44	3.15	0.112	0.047
3/12/2017	5.6	ND	0.076	11.9	0.279	ND
3/15/2017	0.497	0.04	0.025	2.44	2.25	0.025
3/18/2017	0.152	0.25	2.21	0.022	0.022	0.562
3/21/2017	ND	2.84	ND	0.025	0.022	13.3
3/24/2017	0.062	0.029	0.178	ND	0.025	0.025
3/27/2017	ND	0.022	4.86	ND	0.022	0.033
3/30/2017	2.67	0.881	2.66	0.283	0.406	2.67
4/2/2017	4.9	ND	ND	0.044	ND	ND
4/5/2017	0.334	0.729	0.21	ND	ND	3.74
4/8/2017	17.3	0.925	3.2	13.7	28.3	1.05
4/11/2017	8.96	0.029	0.294	3.84	0.036	-Blank-
4/14/2017	24.6	ND	1.35	51.1	12.5	0.218
4/17/2017	18.4	0.029	1.53	17.6	0.12	0.276
4/20/2017	8.27	ND	0.381	7.62	0.319	0.109
4/23/2017	0.765	0.816	0.102	0.051	10.6	0.232
4/26/2017	0.025	0.029	Invalid	0.054	0.029	2.39
4/29/2017	0.044	0.029	2.19	0.033	0.033	0.029

Sample Date	Sample Locations					
	238 Chad Baker	Acorn & Hwy 44	ESJH	5th Ward Elem	Levee	Ochsner
5/2/2017	9.94	11.5	6.6	4.64	9.9	17.6
5/5/2017	ND	2.81	ND	ND	0.174	0.312
5/8/2017	0.508	11	0.297	0.323	9.68	14.9
5/11/2017	0.729	0.254	2.25	ND	0.022	0.247
5/14/2017	ND	ND	ND	ND	1.22	ND
5/17/2017	ND	ND	0.109	ND	ND	ND
5/20/2017	ND	ND	0.025	ND	ND	0.018
5/23/2017	0.098	0.062	ND	ND	ND	0.062
5/26/2017	ND	ND	0.054	ND	ND	0.163
5/29/2017	0.395	0.134	0.323	0.323	1.48	0.725
6/1/2017	7.73	0.214	0.109	2.06	0.366	0.102
6/4/2017	2.57	0.943	2.56	0.116	0.479	0.751
6/7/2017	0.872	ND	ND	1.18	5.59	ND
6/10/2017	19.7	ND	0.91	6.27	ND	ND
6/13/2017	28.6	ND	1.59	0.823	ND	0.758
6/16/2017	ND	4.82	ND	ND	ND	35.9
6/19/2017	26.7	2.59	1.6	10.7	7.76	2.47
6/22/2017	0.16	ND	4.43	ND	ND	ND
6/25/2017	11.8	7.15	0.61	11.8	13.9	0.384
6/28/2017	45.7	ND	2.14	6.6	0.199	ND
7/1/2017	ND	0.167	ND	ND	ND	4.5
7/4/2017	0.058	0.28	ND	ND	ND	6.06
7/7/2017	1.42	6.49	0.308	1.65	2.68	0.94
7/10/2017	0.152	8.31	0.083	4.21	34.2	0.334
7/13/2017	4.63	2.4	0.878	3.7	2.81	1.17
7/16/2017	4.64	5.04	2.73	2.09	5.88	11.2
7/19/2017	1.58	3.55	0.878	3.35	3.81	5.51
7/22/2017	5.11	13.9	1.06	10.2	7	2.02
7/25/2017	ND	0.929	0.345	ND	0.744	2.73
7/28/2017	ND	1.97	ND	ND	0.087	9.14
7/31/2017	4.28	ND	ND	1.76	2.63	ND
8/3/2017	14.3	ND	0.493	5.55	0.892	ND
8/6/2017	5.51	1.66	0.86	1.7	1.1	0.914
8/9/2017	45.3	0.076	ND	26.2	0.479	ND
8/12/2017	ND	12.3	0.276	0.058	0.736	4.68
8/15/2017	4.24	0.526	3.92	2.45	0.831	1.38
8/18/2017	ND	2.92	0.05	ND	0.461	3.41
8/21/2017	5.77	0.225	2.2	0.613	3.59	0.352
8/24/2017	3.27	0.218	0.033	7	1.72	0.776

Sample Date	Sample Locations					
	238 Chad Baker	Acorn & Hwy 44	ESJH	5th Ward Elem	Levee	Ochsner
8/27/2017	33.3	0.432	0.054	1.16	0.406	0.17
8/30/2017	13.9	0.025	2.29	0.308	ND	0.094
9/2/2017	2.39	0.174	0.07	2.81	2.66	0.127
9/5/2017	INVALID	1.15	2.29	0.247	2.15	3.92
9/8/2017	1.18	ND	ND	5.01	3.13	ND
9/11/2017	0.029	ND	ND	17.1	4.28	ND
9/14/2017	4.94	0.13	2.45	6.57	0.37	1.55
9/17/2017	16.2	0.95	1.5	19	4.32	1.3
9/20/2017	0.26	0.04	1.54	0.1	0.05	6.71
9/23/2017	4.53	0.196	0.312	4.9	4.46	0.93
9/26/2017	22.7	0.033	0.025	8.2	1.72	0.018
9/29/2017	29.2	3.59	1.6	21.5	22	3.55
10/2/2017	34.1	0.044	0.062	4.13	0.029	0.033
10/5/2017	29.7	0.025	ND	23.2	0.559	ND
10/8/2017	0.929	0.475	0.022	0.831	0.936	0.058
10/11/2017	0.355	0.279	1.6	0.258	4.79	0.987
10/14/2017	30.4	ND	0.058	15.7	0.047	ND
10/17/2017	0.112	0.044	0.029	0.504	4.82	0.044
10/20/2017	21	0.036	0.036	13.7	0.044	0.036
10/23/2017	0.827	0.794	0.179	0.207	2.09	0.131
10/26/2017	ND	15.5	1.61	0.036	2.99	43.2
10/29/2017	0.033	0.033	0.033	0.036	15.9	0.025
11/1/2017	19.5	0.036	1.44	1.65	0.033	0.025
11/4/2017	7.29	0.029	2.13	0.646	ND	0.127
11/7/2017	0.167	4.28	0.769	0.033	ND	1.44
11/10/2017	1.37	1.2	0.025	2.33	6.46	0.025
11/13/2017	6.2	0.033	0.029	32.1	0.21	0.029
11/16/2017	28.8	0.044	0.036	32.4	0.649	0.036
11/19/2017	0.033	0.138	0.036	0.036	24.1	0.192
11/22/2017	0.464	0.062	0.025	8.2	2.7	0.036
11/25/2017	21.3	17.3	39.5	6.2	21.1	89.2
11/28/2017	70	Invalid	15.4	151	1.07	0.069
12/1/2017	0.192	0.131	0.254	0.395	1.65	0.127
12/4/2017	1.33	ND	0.051	0.794	0.036	-Blank-
12/7/2017	ND	ND	ND	0.076	0.319	ND
12/10/2017	0.083	0.12	ND	0.123	0.395	0.276
12/13/2017	0.029	0.283	0.316	0.018	1.15	0.49
12/16/2017	1.02	0.022	0.015	0.929	0.954	0.018
12/19/2017	3.51	ND	0.58	12.3	--	ND

Sample Date	Sample Locations					
	238 Chad Baker	Acorn & Hwy 44	ESJH	5th Ward Elem	Levee	Ochsner
12/22/2017	ND	ND	1.44	ND	ND	0.258
12/25/2017	0.566	0.015	0.015	2.8	5.59	ND
12/28/2017	0.015	0.018	0.015	1.06	0.468	ND
12/31/2017	6.75	ND	ND	9.39	4.24	ND
1/3/2018	ND	ND	ND	0.0598	2.66	ND
1/6/2018	16.9	ND	0.0526	23.6	2.72	ND
1/9/2018	ND	ND	ND	ND	11.6	ND
1/12/2018	ND	1.6	0.392	ND	0.289	1.66
1/15/2018	2.65	3.84	3.84	4.5	12	5.37
1/19/2018	2.15	6.06	0.566	2.49	4.64	5.55
1/22/2018	15.6	ND	2.09	3.17	ND	1.78
1/25/2018	7	0.025	0.0225	2.62	26.4	ND
1/28/2018	1.7	0.0196	0.0236	10.8	10.5	0.0221
1/31/2018	30.9	ND	30.3	INVALID	9.68	0.111
2/3/2018	8.45	0.016	0.0185	3.55	0.018	ND
2/6/2018	32	ND	0.016	32.4	0.598	ND
2/9/2018	16.5	ND	0.0406	3.95	Invalid	ND
2/12/2018	0.0319	0.0348	ND	0.0243	1.19	0.0334
2/15/2018	0.0308	ND	3.12	0.0406	0.0337	Invalid
2/18/2018	4.43	0.889	0.424	0.972	0.852	3.95
2/21/2018	ND	0.0323	0.773	0.0305	0.0243	0.0316
2/24/2018	0.624	0.0297	1.02	0.0229	ND	0.0591
2/27/2018	8.02	0.0265	0.0374	1.2	0.0497	0.0232
3/2/2018	0.0606	0.0479	0.0247	0.896	0.889	0.021
3/5/2018	0.747	ND	0.33	0.49	0.403	0.088
3/8/2018	ND	ND	ND	0.0809	0.91	ND
3/11/2018	1.36	0.0736	0.722	0.136	0.191	0.0939
3/14/2018	0.128	13.8	0.0196	3.57	28.3	0.228
3/17/2018	ND	ND	0.718	ND	ND	1.06
3/20/2018	ND	0.453	ND	ND	ND	0.199
3/23/2018	4.75	0.849	1.04	5.15	2.42	2.75
3/26/2018	ND	0.0345	0.907	0.0374	0.0359	0.114
3/29/2018	0.0218	0.0406	0.689	0.0196	0.443	0.105
4/1/2018	3.7	ND	0.783	8.96	2.7	0.053
4/4/2018	0.285	0.0925	0.377	0.319	0.715	0.49
4/7/2018	ND	0.482	0.359	ND	0.321	0.0693
4/10/2018	0.0424	ND	ND	0.119	1.04	ND
4/13/2018	ND	ND	2.47	ND	ND	0.0178
4/16/2018	ND	0.388	ND	ND	0.0243	0.0185

Sample Date	Sample Locations					
	238 Chad Baker	Acorn & Hwy 44	ESJH	5th Ward Elem	Levee	Ochsner
4/19/2018	ND	1.11	ND	ND	2.54	1.49
4/22/2018	0.421	ND	0.482	0.101	ND	0.0258
4/25/2018	ND	3.99	ND	ND	4.72	0.12
4/28/2018	0.522	7.51	ND	4.86	22.1	ND
5/1/2018	0.261	0.0229	0.1	INVALID	ND	ND
5/4/2018	ND	0.0272	0.049	INVALID	0.0268	0.0297
5/7/2018	ND	0.34	ND	ND	1.35	ND
5/10/2018	10.8	ND	4.53	2.22	0.0479	0.328
5/13/2018	3.35	ND	0.299	0.947	0.0341	0.0185
5/16/2018	0.0341	0.235	0.106	0.0428	1.82	0.226
5/19/2018	0.827	0.598	0.54	0.172	0.297	0.435
5/22/2018	ND	0.504	0.0671	0.0105	1.26	0.7
5/25/2018	0.1	0.885	0.116	0.222	2.29	0.0591
5/28/2018	0.468	ND	ND	0.103	3.53	ND

*ND = Concentration not detected
§-- = No sample received in lab
†Invalid = Sample was invalid
‡U = Concentration below method detection limit
**-Blank- = Data cell left empty in EPA data file
NOTE: No samples collected on August 16-20, 2016 due to flooding in Louisiana
Highlighted in yellow = concentration above 20 ug/m3
Highlighted in blue = concentration not detected

APPENDIX B: Evaluation of Chloroprene Data, May 2016-May 2018

Table B-1. Summary of chloroprene concentrations in micrograms per cubic meter (ug/m^3) in EPA ambient air canister samples (24-hr) collected from LaPlace, LA, in 2016

	2016			
Air Monitor Location	Samples per Location	% Detects Per Location	% Concentrations > 0.2 ug/m^3	% Concentrations > 20 ug/m^3
238 Chad Baker	69	84.06	76.81	20.29
Acorn & Hwy 44	70	64.29	51.43	8.57
ESJH	70	80.00	64.29	1.43
5th Ward Elem	69	81.16	76.81	15.94
Levee	69	86.96	81.16	13.04
Ochsner	70	68.57	89.58	7.14

Table B-2. Summary of chloroprene concentrations in micrograms per cubic meter (ug/m^3) in EPA ambient air canister samples (24-hr) collected from LaPlace, LA, in 2017

	2017			
Air Monitor Location	Samples per Location	% Detects Per Location	% Concentrations > 0.2 ug/m^3	% Concentrations > 20 ug/m^3
238 Chad Baker	121	77.69	61.16	13.22
Acorn & Hwy 44	121	71.07	42.98	0.00
ESJH	121	76.86	47.93	1.65
5th Ward Elem	122	77.05	61.48	6.56
Levee	120	80.00	62.50	5.00
Ochsner	120	75.83	45.00	2.50

Table B-3. Summary of chloroprene concentrations in micrograms per cubic meter (ug/m^3) in EPA ambient air canister samples (24-hr) collected from LaPlace, LA, in 2018

	2018			
Air Monitor Location	Samples per Location	% Detects Per Location	% Concentrations > 0.2 ug/m^3	% Concentrations > 20 ug/m^3
238 Chad Baker	49	67.35	51.02	4.08
Acorn & Hwy 44	49	63.27	34.69	0.00
ESJH	49	75.51	46.94	2.04
5th Ward Elem	46	78.26	45.65	4.35
Levee	48	85.42	64.58	6.25
Ochsner	48	72.92	29.17	0.00

Figure B-1. Data summary for 238 Chad Baker air sampling location

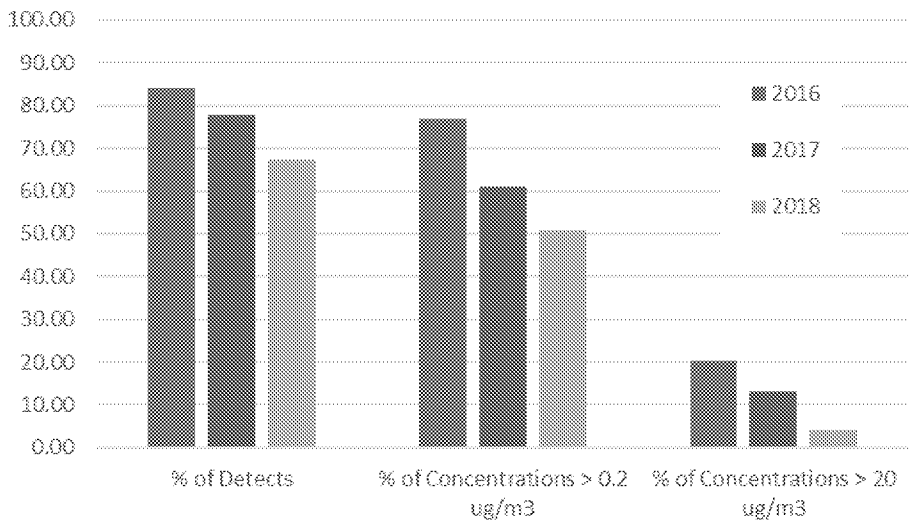


Figure B-2. Data summary for Acorn & Highway 44 air sampling location

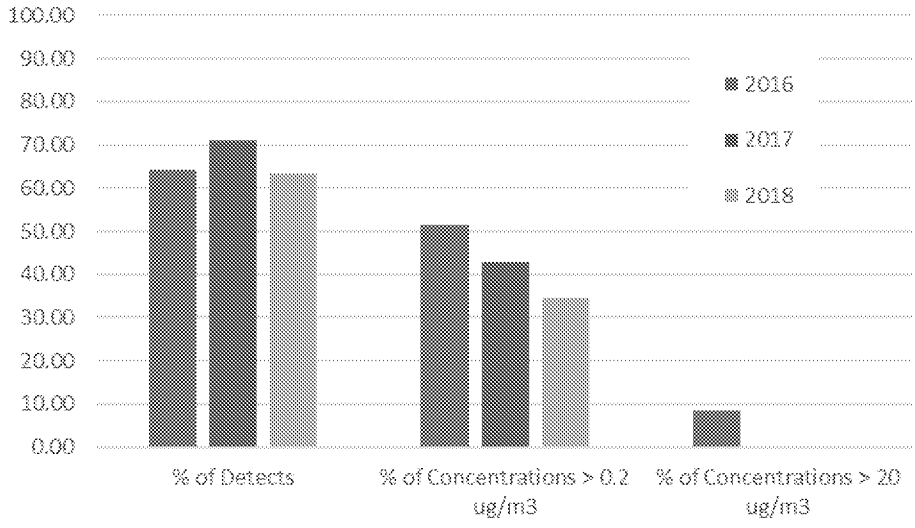


Figure B-3. Data summary for East St John Hospital air sampling location

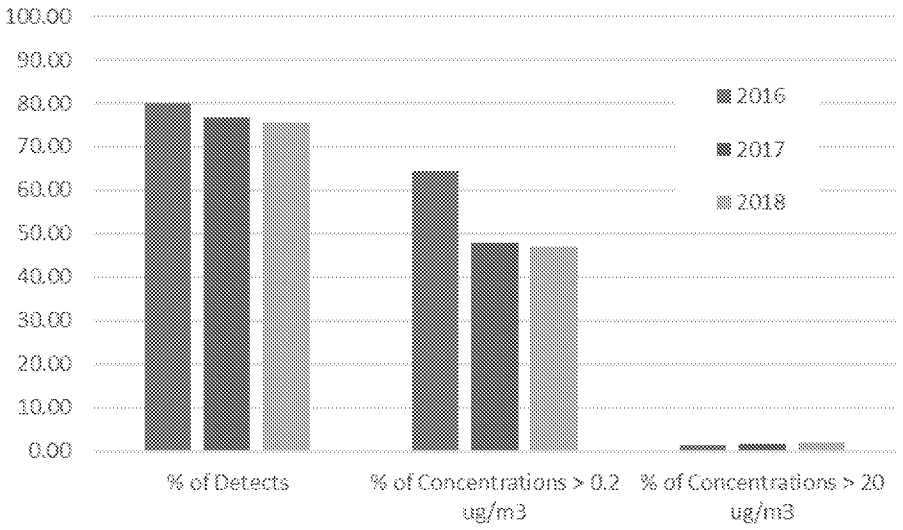
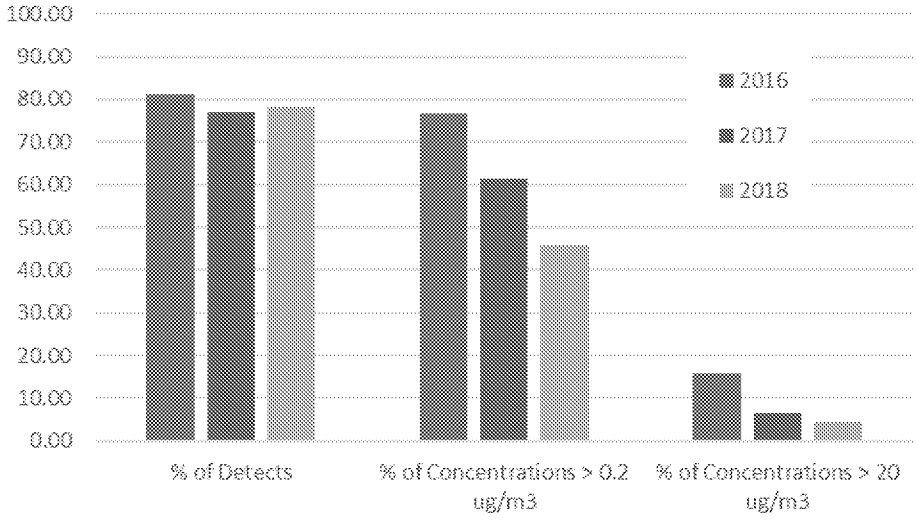


Figure B-4. Data summary for 5th Ward Elementary School air sampling location



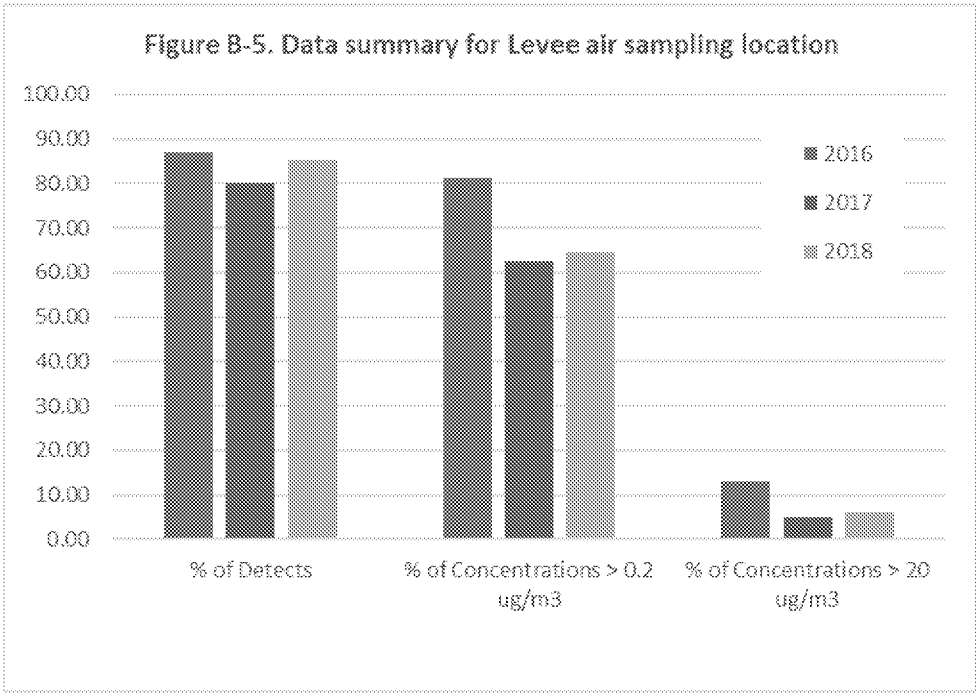


Figure B-5. Data summary for Levee air sampling location
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
2016
2017
2018
% of Detects
% of Concentrations > 0.2 ug/m3
% of Concentrations > 20 ug/m3

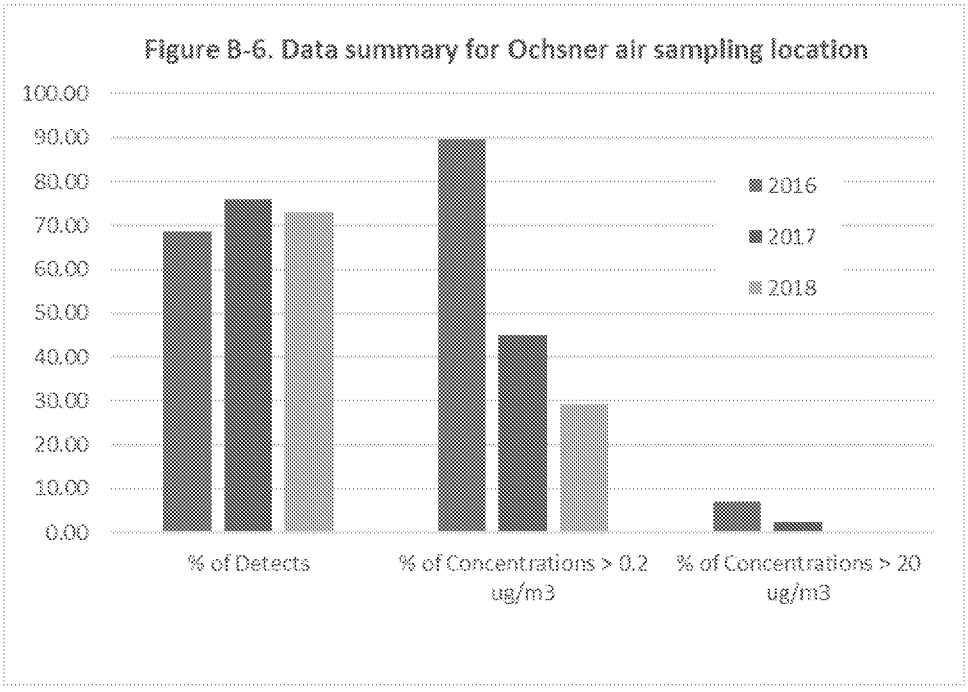


Figure B-6. Data summary for Ochsner air sampling location
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
2016
2017
2018
% of Detects
% of Concentrations > 0.2 ug/m3
% of Concentrations > 20 ug/m3

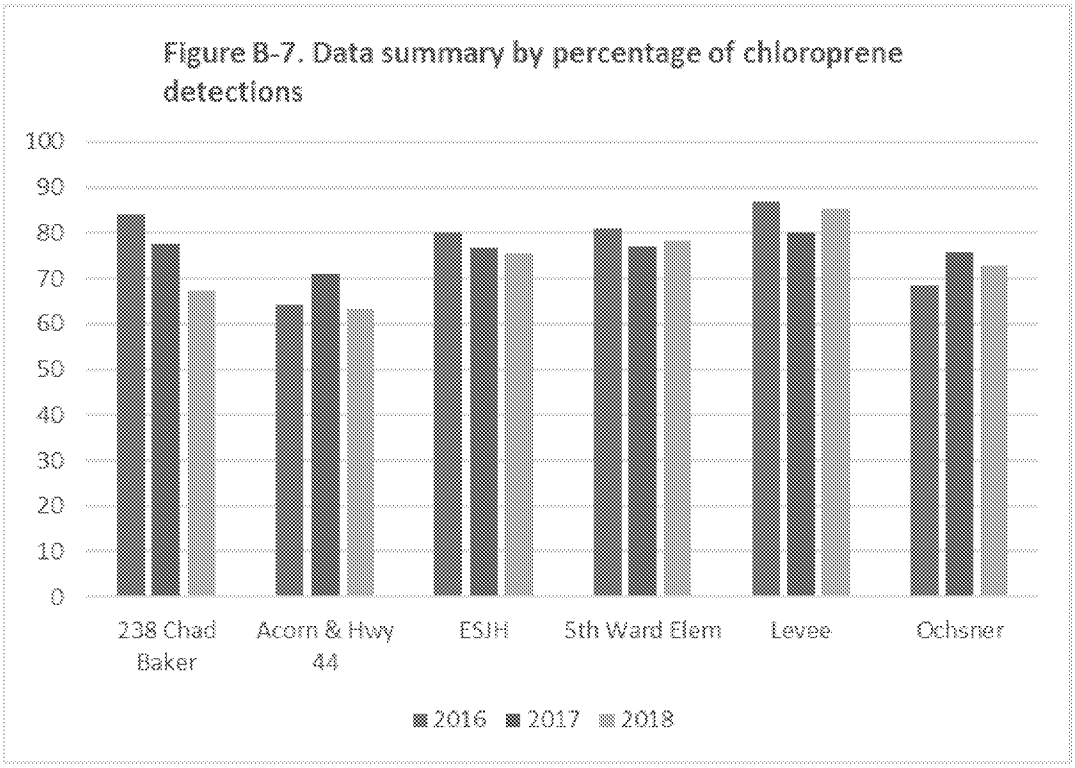


Figure B-7. Data summary by percentage of chloroprene detections
100
90
80
70
60
50
40
30
20
10
0
238 Chad Baker
Acorn & Hwy 44
ESJH
5th Ward Elem
Levee
Ochsner
2016
2017
2018

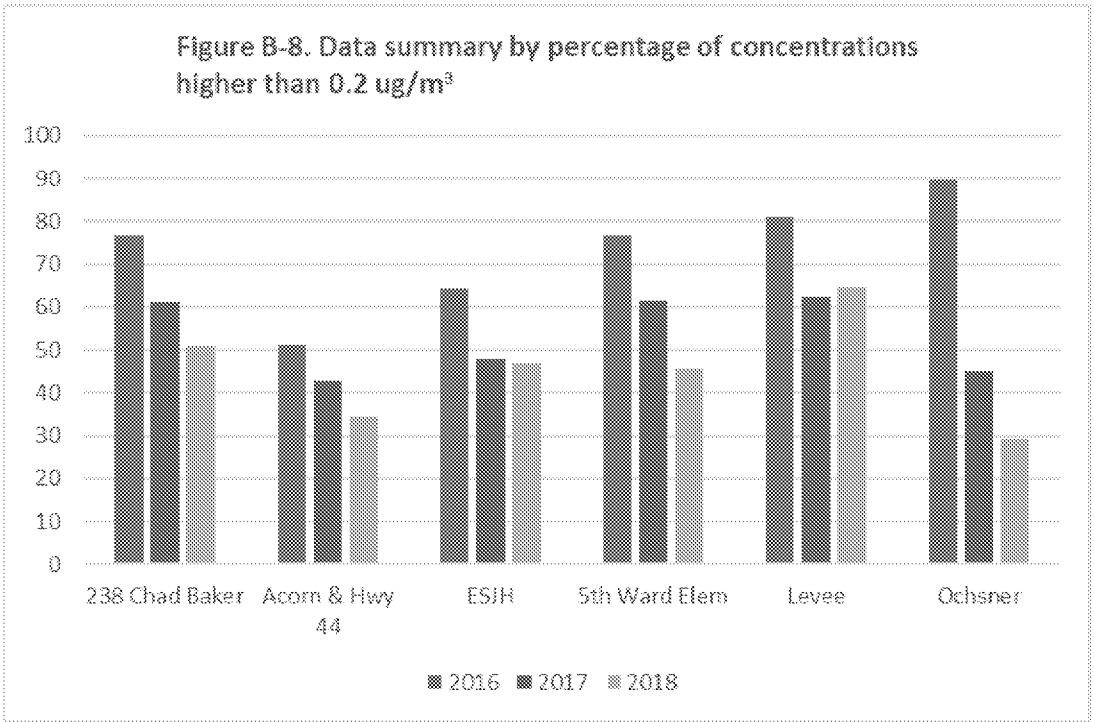


Figure B-8. Data summary by percentage of concentrations higher than 0.2 ug/m³
100
90
80
70
60
50
40
30
20
10
0
238 Chad Baker
Acorn & Hwy 44
ESJH
5th Ward Elem
Levee
Ochsner
2016
2017
2018

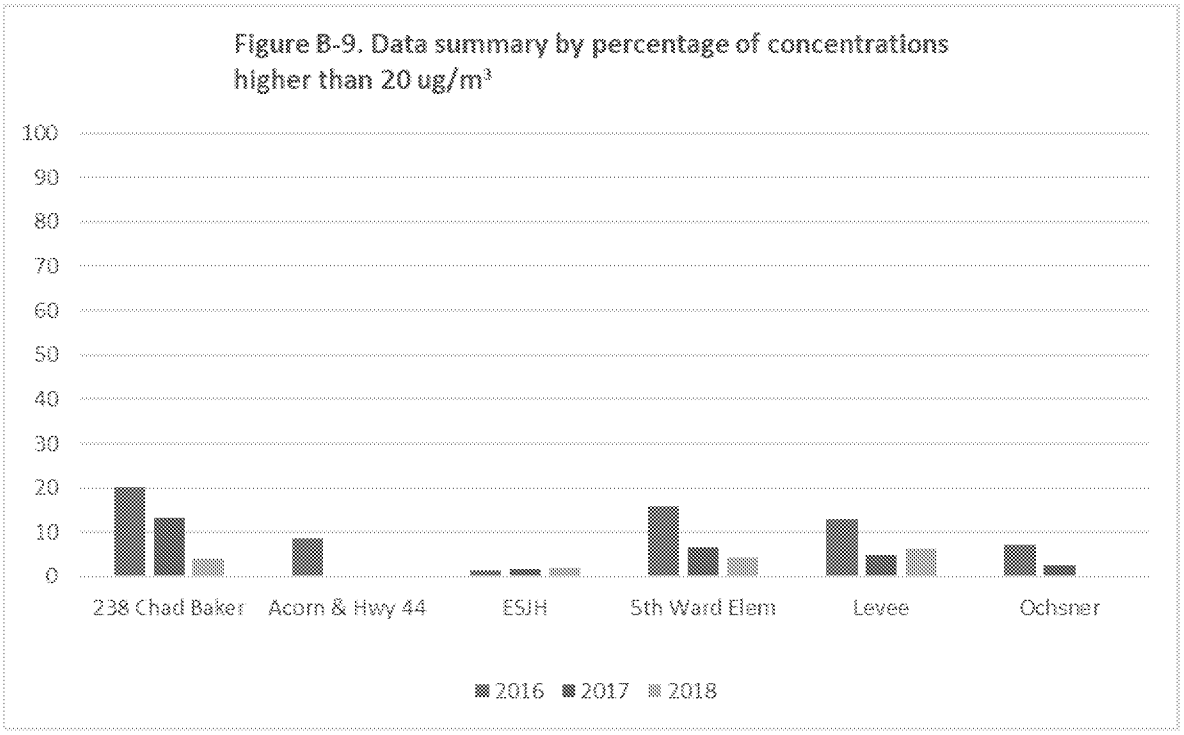


Figure B-9. Data summary by percentage of concentrations higher than 20 ug/m³
100
90
80
70
60
50
40
30
20
10
0
238 Chad Baker
Acorn & Hwy 44
ESJH
5th Ward Elem
Levee
Ochsner
2016
2017
2018

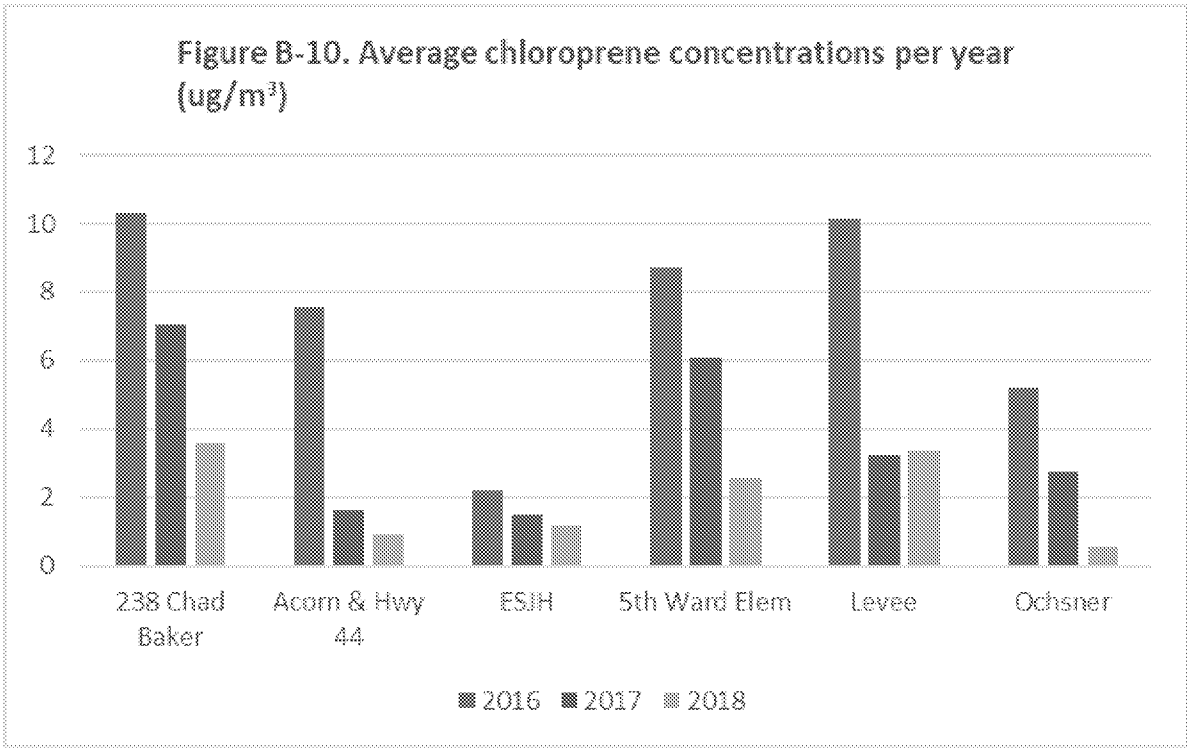


Figure B-10. Average chloroprene concentrations per year (ug/m³)
12
10
8
6
4
2
0
238 Chad Baker
Acorn & Hwy 44
ESJH
5th Ward Elem
Levee
Ochsner
2016
2017
2018

APPENDIX C: Statistical Analyses of Chloroprene Data

For the statistical analyses, samples reported as nondetects (ND) were conservatively assessed using a concentration of half the current detection limit. The EPA laboratory re-calculates the lowest concentration detectable by the laboratory method (the method detection limit, or MDL) on an annual basis; consequently, the MDL used to analyze the chloroprene data changed from 0.036 ug/m3 in 2016 to 0.073 ug/m3 in February 2017 and to 0.0468 ug/m3 in January 2018 (US EPA). Half of the current detection limit of 0.0468 ug/m^3 is 0.0234 ug/m^3.

Table C-1. Statistical analyses of average chloroprene concentrations (in ug/m^3) at the 238 Chad Baker air sampling site

	2016	2017	2018
Average	10.31	7.08	3.57
Lower CI	7.20	4.92	1.48
Upper CI	13.42	9.25	5.66
St Dev	12.94	12.03	7.28
Sample Size	69	121	49

CI = Confidence Interval
St Dev = Standard Deviation

Table C-2. Statistical analyses of average chloroprene concentrations (in ug/m^3) at the Acorn & Highway 44 sampling site

	2016	2017	2018
Average	7.53	1.61	0.90
Lower CI	1.89	0.98	0.20
Upper CI	13.16	2.23	1.60
St Dev	23.63	3.48	2.42
Sample Size	70	121	49

CI = Confidence Interval
St Dev = Standard Deviation

Table C-3. Statistical analyses of average chloroprene concentrations (in ug/m^3) at the East St John High School site

	2016	2017	2018
Average	2.21	1.49	1.17
Lower CI	1.17	0.70	-0.08
Upper CI	3.24	2.29	2.43
St Dev	4.35	4.42	4.36
Sample Size	70	121	49

CI = Confidence Interval
St Dev = Standard Deviation

Table C-4. Statistical analyses of average chloroprene concentrations (in ug/m^3) at the Fifth Ward Elementary School air sampling site

	2016	2017	2018
Average	8.70	6.09	2.56
Lower CI	5.43	3.11	0.77
Upper CI	11.96	9.08	4.36
St Dev	13.58	16.68	6.05
Sample Size	69	122	46

CI = Confidence Interval
St Dev = Standard Deviation

Table C-5. Statistical analyses of average chloroprene concentrations (in ug/m^3) at the Levee air sampling site

	2016	2017	2018
Average	10.13	3.21	3.37
Lower CI	4.84	2.03	1.46
Upper CI	15.42	4.39	5.28
St Dev	22.02	6.52	6.58
Sample Size	69	120	48

CI = Confidence Interval
St Dev = Standard Deviation

Table C-6. Statistical analyses of average chloroprene concentrations (in ug/m^3) at the Ochsner air sampling site

	2016	2017	2018
Average	5.21	2.73	0.57
Lower CI	2.27	0.95	0.20
Upper CI	8.15	4.51	0.94
St Dev	12.32	9.84	1.29
Sample Size	70	120	48

CI = Confidence Interval
St Dev = Standard Deviation

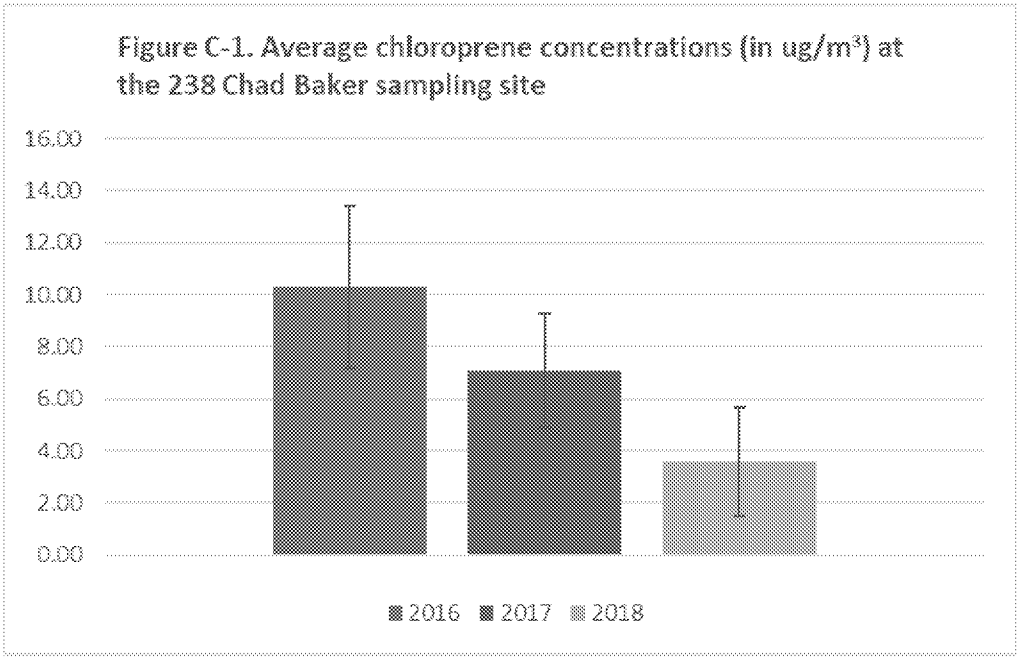


Figure C-1. Average chloroprene concentrations (in ug/m³) at the 238 Chad Baker sampling site
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
2016
2017
2018

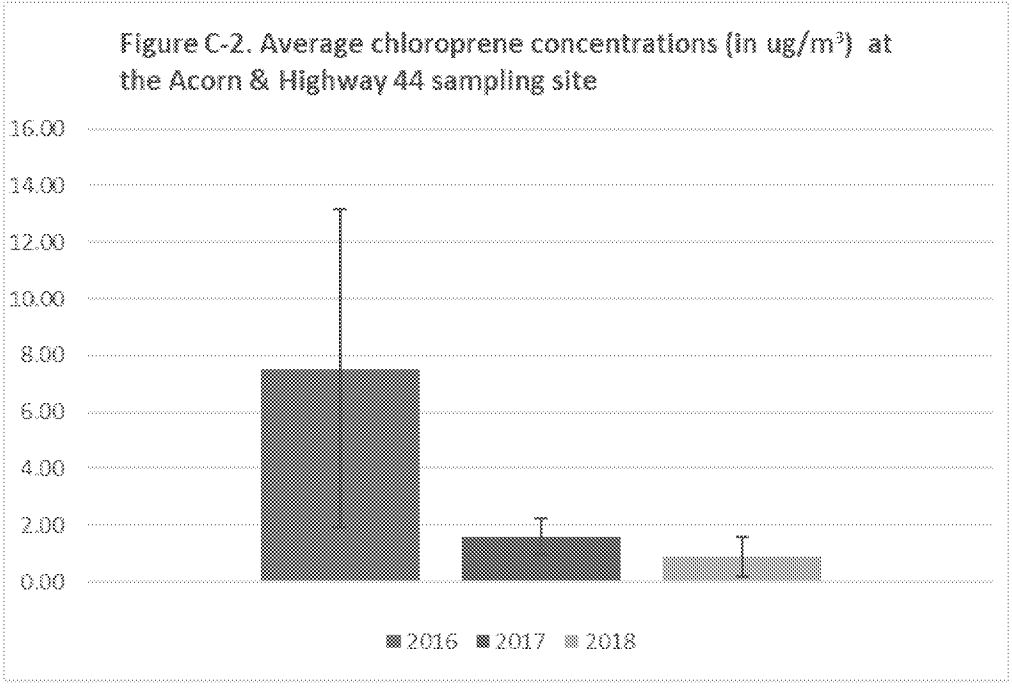


Figure C-2. Average chloroprene concentrations (in ug/m³) at the Acorn & Highway 44 sampling site
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
2016
2017
2018

Figure C-3. Average chloroprene concentrations (in ug/m^3) at the East St John High School sampling site

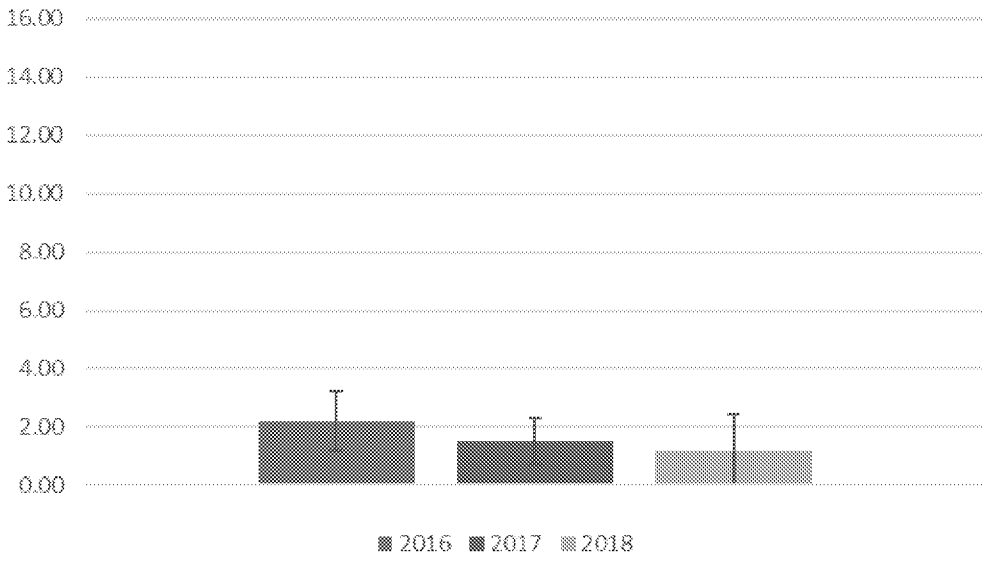
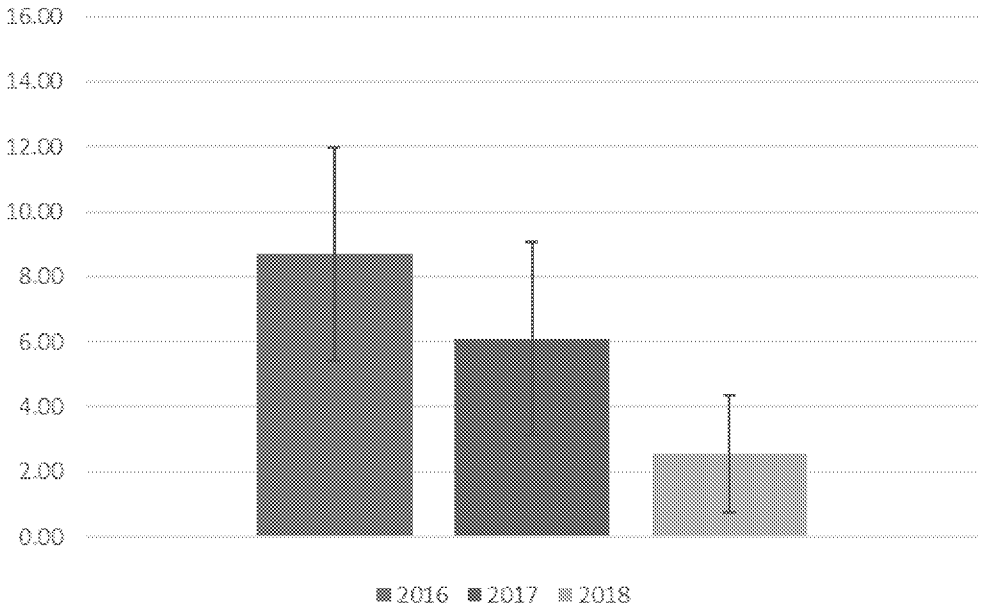


Figure C-4. Average chloroprene concentrations (in ug/m^3) at the Fifth Ward Elementary School sampling site



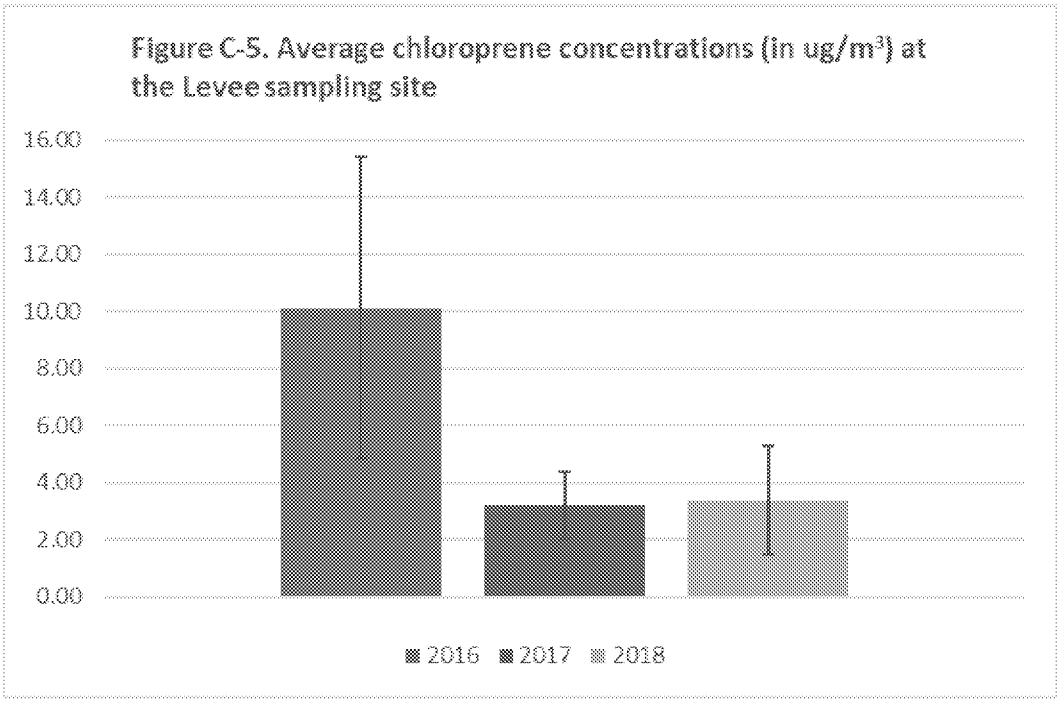


Figure C-5. Average chloroprene concentrations (in ug/m³) at the Levee sampling site
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
2016
2017
2018

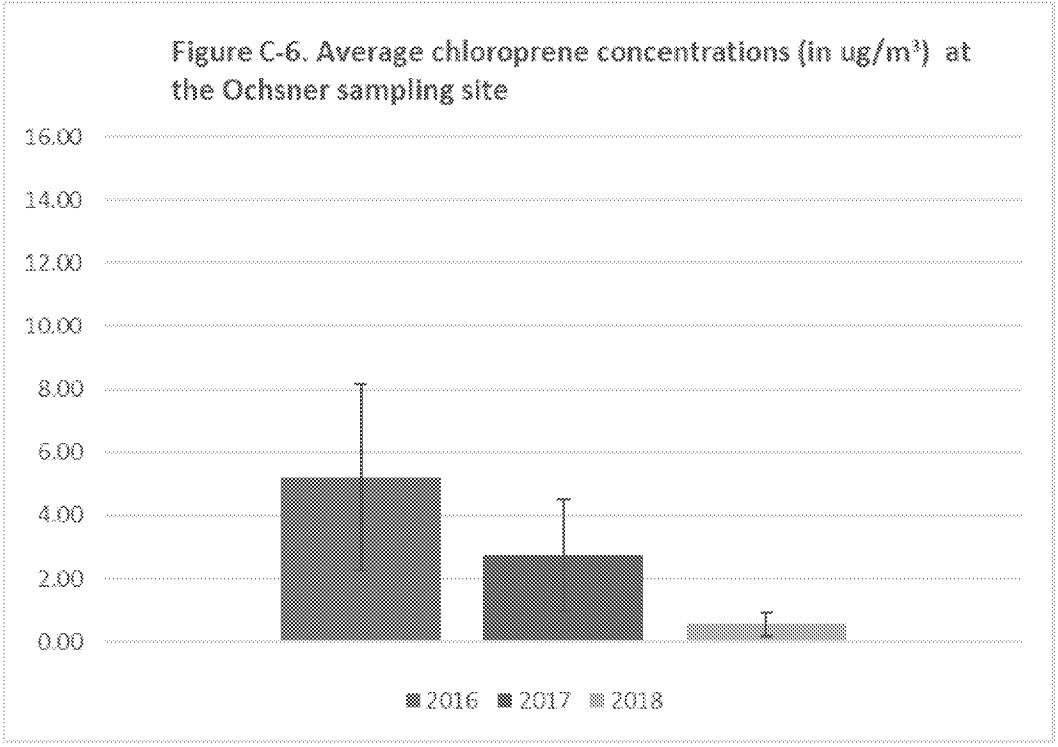


Figure C-6. Average chloroprene concentrations (in ug/m³) at the Ochsner sampling site
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
2016
2017
2018